

## LEGEND

## Quaternary System

## RECENT SERIES

Qra ALLUVIUM

## Tertiary System

Td DIANA'S BASIN SANDS AND GRAVELS

## Permian System

P

## Mathinna Group

Ds SCAMANDER SLATE AND QUARTZITE

## IGNEOUS ROCKS

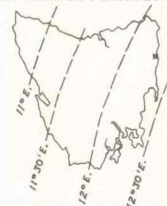
Jdl JURASSIC DOLERITE

py ST. MARY'S PORPHYRY

Dc COASTAL RANGE QUARTZ MONZONITE

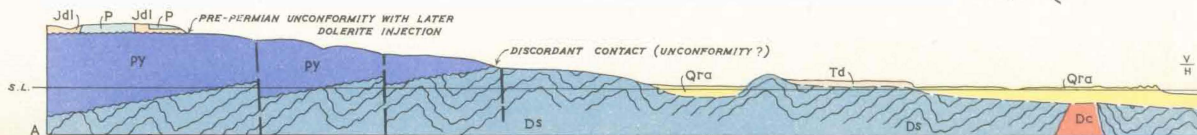
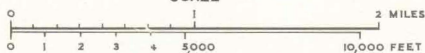
Compilation from Aerial Photographs.  
Trigonometric Station Control by  
courtesy Lands and Surveys Dept.  
Origin of co-ordinates 400,000 yds.  
West and 1,800,000 yds. South of  
True Origin of Zone 7.

KEY MAP SHOWING MAGNETIC DECLINATIONS  
SECULAR VARIATION 7 MINS. PER ANNUM



- FAULT WITH DOWNTROWN SIDE INDICATED
- PHOTO-INTERPRETED FAULT
- ESTABLISHED BOUNDARY — POSITION ACCURATE
- ESTABLISHED BOUNDARY — POSITION APPROXIMATE
- DISCORDANT INTRUSIVE BOUNDARIES
- DISCORDANT INTRUSIVE BOUNDARY WITH CONCOMITANT FAULTING
- STRIKE AND DIP
- ROADS
- VEHICULAR TRACK
- TRACK
- PHOTO CENTRE

— SCALE —



MAPPED AND COMPILED BY  
K. R. WALKER 1953

# GEOLOGY OF FALMOUTH

## SHEET 6088

### PHYSIOGRAPHY.

Two physiographic units occur in this area, a low, mountainous, early mature hinterland and a partially rejuvenated, youthful coastal plain. Drainage more or less radiates from the area around German Town and St. Patrick's Head. The streams are in mountain tract for about half their course and then enter valley tract in which they remain till they reach the sea. In the Scamander Slate and Quartzite the joints control the streams and in the St. Marys Porphyry streams are controlled by faults. The coastal plain ranges from 350 feet above sea level inland to 170 feet towards the coast. This plain is deeply dissected but the hills still carry a cover of sediment and hill levels are accordant. Still closer to the coast are the barred lakes, lagoons and swamps behind the beach ridges and beaches. South of Falmouth the coast is cliffed but to the north it is mainly long beaches, and the coast is comparatively straight. The Scamander River is considered to have originally flowed into the sea near Falmouth.

### STRATIGRAPHY AND IGNEOUS ROCKS.

The basement rock in the area is the Scamander Slate and Quartzite. This formation is of unknown thickness and contains argillites and arenites of the sub-greywacke suite. North of the area it contains primitive vascular plants and fragmental marine fossils. It may be in part Silurian or Lower Devonian. The deposition of these beds was followed by folding, then intrusion of the Coastal Range Quartz Monzonite. Sometime later the St. Marys Porphyry was emplaced, perhaps as a lava flow. Tilting and erosion followed before deposition of the Permian sediments began. Several Permian formations are present and include a limestone and a glauconitic sandstone. Later, probably in the Jurassic Period, the Permian sediments were disrupted by dolerite intrusions.

Later faulting further disrupted the Permian and older rocks and after this the coastal plain and the sediments on it developed.

### STRUCTURAL GEOLOGY.

The Scamander Formation is folded along axes trending N15°E to N20°E and generally somewhat overturned to the east. Where the base of the St. Marys Porphyry is exposed it is seen to be dipping 15° to the south. The Permian and Tertiary beds are virtually horizontal.

Faults affect the Scamander Formation, Coastal Range Monzonite, St. Marys Porphyry and the Permian sediments. These form a conjugate system, trending north-west and north-east. Some of these at least are post-Permian as the Enstone Park Limestone (Permian) occurs on Rays Hill and much lower topographically at Enstone Park. Faults associated with the intrusion of dolerite also affect the Permian beds near German Town.

### POINTS OF SPECIAL INTEREST.

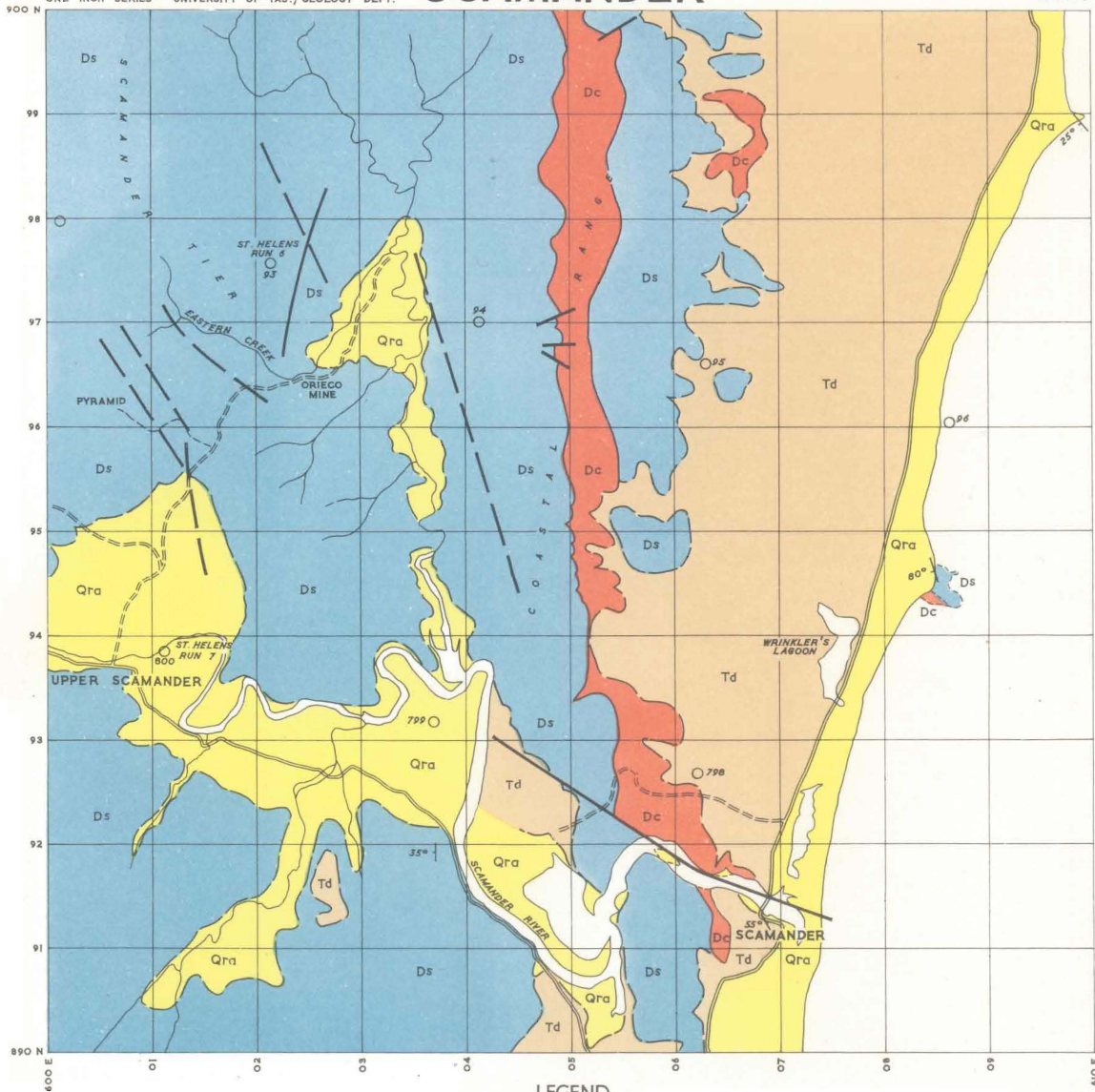
Permian Section on Rays Hill (600.5E.880.5N)

St. Marys Porphyry in St. Marys Pass (602.5E.880.5N)

Base of St. Marys Porphyry (602.2E.886N)

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## LEGEND

## Quaternary System

## RECENT SERIES

Qra ALLUVIUM

Tertiary System

Td DIANA'S BASIN SANDS AND GRAVELS

Mathinna Group

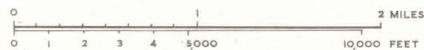
Ds SCAMANDER SLATE AND QUARTZITE

## IGNEOUS ROCKS

Dc COASTAL RANGE QUARTZ MONZONITE

- D — FAULT WITH DOWNTHEOWN SIDE INDICATED  
 — PHOTO — INTERPRETED FAULT  
 — ESTABLISHED BOUNDARY — POSITION ACCURATE  
 — ESTABLISHED BOUNDARY — POSITION APPROXIMATE  
 55° STRIKE AND DIP  
 — ROADS  
 — VEHICULAR TRACK  
 — TRACK  
 — BRIDGE  
 O PHOTO CENTRE

— SCALE —



Compilation from Aerial Photographs.  
 Trigonometric Station Control by  
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KEY MAP SHOWING MAGNETIC DECLINATION  
 SECULAR VARIATION 7 MINS. PER ANNUM



MAPPED AND COMPILED BY  
 K. R. WALKER - 1953



# GEOLOGY OF SCAMANDER.

## SHEET 6089

### PHYSIOGRAPHY.

There are three physiographic units in this area. The western-most one is characterised by Scamander Tier and the Coastal Range and is an area of late youthful or early mature topography drained dominantly by streams in their mountain tract. The exception to this is the Scamander River which is a drowned river in its valley tract. Further east still is the coastal plain with a veneer of gravels and sands up to a height of 350 feet. This is deeply dissected but still youthful. Near the coast this plain is succeeded by a strip of lagoons, swamps, marshes, beach ridges and long sweeping sandy beaches with occasional rocky headlands.

The western unit seems to have been part of an easterly dipping uplifted surface which locally reaches 1,500 feet high on Scamander Tier. Drainage in the western area has a trellised pattern, being controlled by bedding and prominent joints at right angles to it.

### STRATIGRAPHY.

The oldest rock in the area is the Scamander Slate and Quartzite. This formation consists of slates, siltstones, quartzites, sandstones and sub-greywackes. Some banding is present. Depositional rolls, slump structures and cross-bedding occur. Fossils in this formation include primitive vascular plants and fragmental marine fossils.

The next formation is the Diana's Basin Sand and Gravel which caps the coastal plain. These reach a thickness of 150 feet and are up to 350 feet above sea level at which height a ferruginous granule conglomerate is common. No fossils have been found in the formation and it is regarded as Tertiary on physiographic grounds.

The youngest beds in the area are the dune and beach sands and river alluvium.

### IGNEOUS ROCKS.

The Coastal Range Quartz Monzonite forms the axis of the Coastal Range where it intrudes the Scamander Slate and Quartzite with sharp contacts. Temperature of the intrusion was just enough to produce plastic deformation of the intruded rocks. The monzonite contains andesine, microcline, quartz, biotite and hornblende with some orthoclase, apatite, muscovite and other minerals in small amounts. Numerous textural variations occur; aplitic and pegmatitic veins occur associated with the main stock. Transgressing the quartz monzonite are dykes of diorite porphyry which also intrudes some of the aplites. The diorite porphyry consists essentially of labradorite and hornblende. Quartz dolerite dykes cut the Scamander Formation and the monzonite and may be late magmatic differentiates of the monzonite magma.

### STRUCTURAL GEOLOGY.

The Scamander Formation is folded along axes trending N15°E to N20°E and usually overturned slightly to the east.

Faults with a north-easterly, easterly and south-easterly trend offset the monzonite contact but only by small amounts. A fault trending somewhat south of east displaces the contact of the monzonite, south side east, on the Scamander River and reduces the width of outcrop of the monzonite stock considerably suggesting a downthrow to the south.

### ECONOMIC GEOLOGY.

The Pyramid, Orieco and Beulah Mines occur within this area. The Orieco deposit contains copper in the form of chalcopyrite in ore shoots in crush zones in thinly bedded slates. The Beulah Mine was worked unsuccessfully for silver. None of the mines is economically significant at present.

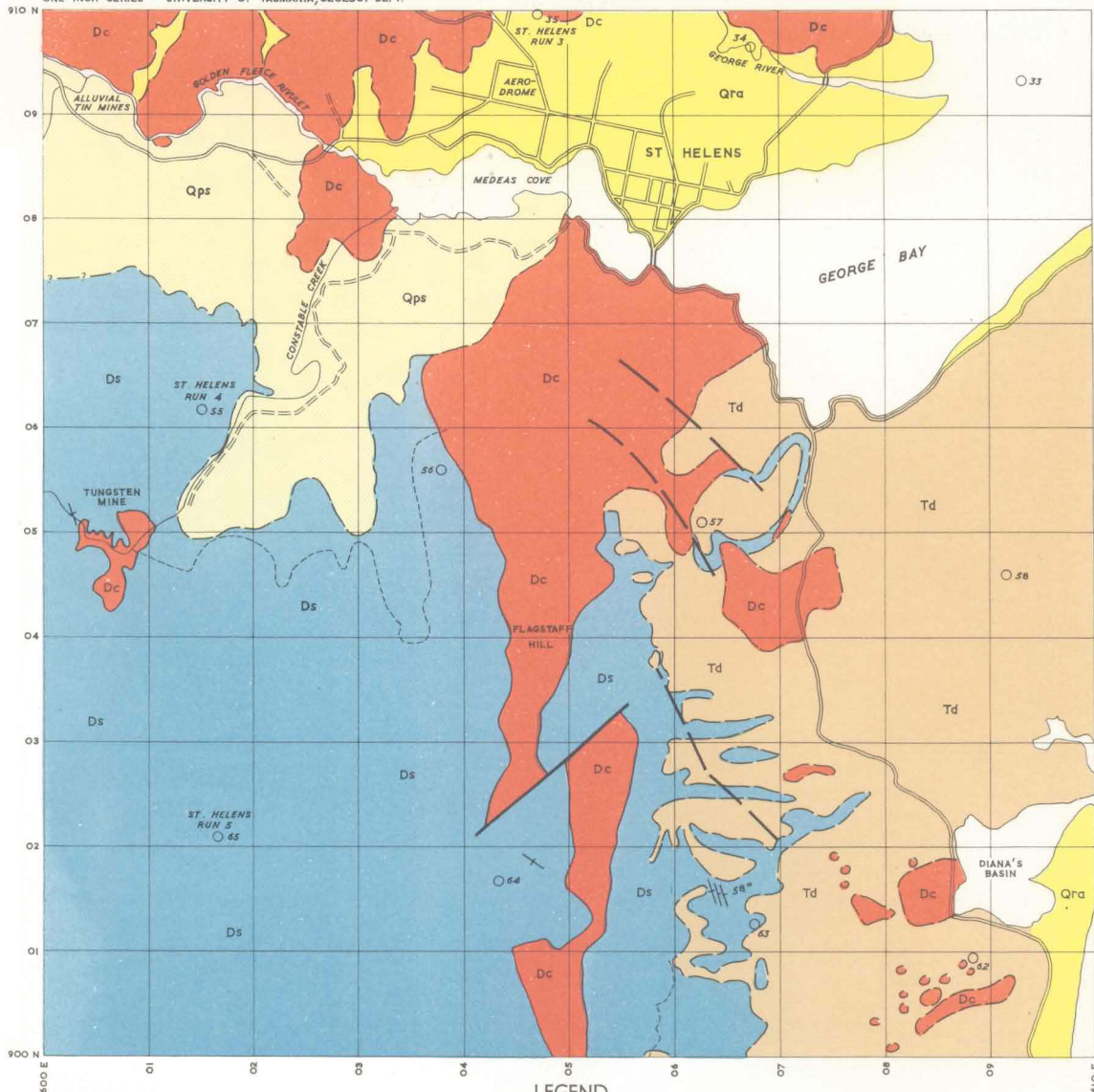
### POINTS OF SPECIAL INTEREST.

Scamander Formation with fossils in cuttings on the Upper Scamander Road (604.000E.891.5N)  
Scamander Formation marine fossils in quarry on south side of bridge over Scamander River (606.8E.891.6N).

Beulah Mine (606.3E.891.6N).

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Waller, G. A., 1901—Report on the Mining Districts of the Scamander River and St. Helens. **Sec. Mines Rept.**, 1900-1901. **Parl. Paper** No. 4, 1901.



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 - - - - - TRACK  
 ——— BRIDGE  
 ○ PHOTO CENTRE  
 + VERTICAL DIP

## Quaternary System

## RECENT SERIES

Qra ALLUVIUM

## PLEISTOCENE SERIES

Qps ST. HELENS CLAYS AND GRAVELS

## Tertiary System

Td DIANA'S BASIN SANDS AND GRAVELS

## Mathinna Group

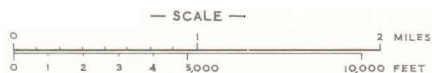
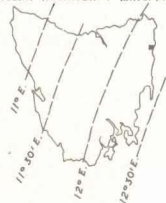
Ds SCAMANDER SLATE AND QUARTZITE

## IGNEOUS ROCKS

Dc COASTAL RANGE QUARTZ MONZONITE

Compilation from Aerial Photographs.  
Trigonometric Station Control by  
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Origin of co-ordinates 400,000 yds.  
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True Origin of Zone 7.

KEY MAP SHOWING MAGNETIC DECLINATIONS  
SECULAR VARIATION 7 MINS. P.A.



MAPPED AND COMPILED BY  
K. R. WALKER 1953

# GEOLOGY OF ST. HELENS.

## SHEET 6090

### PHYSIOGRAPHY.

There are four physiographic units in this area. The south-west is an area of deeply dissected Scamander Formation and granite. This rises to about 1,500 feet in the west and is probably part of an uplifted surface dipping east. The streams in this area are in mountain tract and form a trellised drainage, the details of the stream courses being controlled partly by bedding but dominantly by jointing. The topography is late youthful or early mature. East of this is the coastal plain rising landward to 350 feet above sea level and covered with a veneer of sediments. This is dissected by streams flowing east to the sea which have cut valleys up to 150 feet deep. On its eastern boundary this drops sharply from 170 feet to the third unit, the lagoon and swamp area behind the beach ridges, the ridges themselves and the beaches. The coastline consists of long sweeping sandy beaches with rocky headlands and several islands off-shore. The coastal plain may have extended to the west and south-west of St. Helens up Constable Creek and Golden Fleece Rivulet. Around St. Helens itself is a fourth area only a few feet above sea level which is a flat alluvial plain.

### STRATIGRAPHY.

The Scamander Formation occupies large parts of the area and consists of slates and quartzites for the most part. In the area to the south primitive land plants and fragmental marine fossils occur.

Unconformably on the Scamander Formation and Coastal Range Quartz Monzonite is the Diana's Basin Sand and Gravel. This forms a veneer on the coastal plain up to 350 feet above sea level and is at least 150 feet thick. In many places it is capped by a ferruginous granule conglomerate.

In the immediate vicinity of St. Helens Thureau's Deep Lead extends to 200 feet below sea level. The sediments in the Deep Lead and surrounding areas are called the St. Helens Clay and Gravel and contain some tin.

### IGNEOUS ROCKS.

The only igneous rock in the area is the Coastal Range Quartz Monzonite with its associated differentiates. Contacts with intruded sediments are sharp but just north of Diana's Basin the intrusion has produced plastic deformation of the sediments. The monzonite contains andesine, microcline, quartz, biotite and hornblende with some orthoclase, apatite, muscovite and other minerals in small amounts. Numerous textural variations occur. Transgressing the quartz monzonite are dykes of diorite porphyry which consists essentially of labradorite and hornblende.

### STRUCTURAL GEOLOGY.

West and immediately east of the Coastal Range the Scamander Formation has been folded along axes trending N15°-20°E and somewhat overturned to the east. On the coast north of Diana's Basin, however, the strike is consistently N55°W and the dip is very steep with some intricate overfolding to the north, some of the folds being recumbent and open to the south. Faulting can rarely be demonstrated but a north-easterly trending fault displaces the monzonite stock about a mile south of Flagstaff Hill (605E.902.8N).

### ECONOMIC GEOLOGY.

Wolframite is being worked on the upper part of Constable Creek. It occurs in veins with quartz, scheelite, molybdenite and bismuth. The veins which are not more than 6 feet thick strike 285° and are mainly in the quartz monzonite but in places cut the country rock where some cassiterite is developed.

Thureau's Deep Lead has been tested and found to contain tin which has been worked in some of the subsidiary leads. At Goshen tin occurs in wash overlying granite and in the overburden. Some wolframite also occurs with it.

White clays occur in tin workings and on the southern headland of George's Bay.

### POINTS OF SPECIAL INTEREST.

Intrusion of granite and folding on first headland north of Diana's Basin.

Sediments on southern headland of George Bay.

Tungsten Mine on Constable Creek.

### BIBLIOGRAPHY.

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